# SEQUENCE LISTING

#### (1) GENERAL INFORMATION:

- (i) APPLICANT: Evans, Ronald M. No, David
- (ii) TITLE OF INVENTION: HORMONE-MEDIATED METHODS FOR MODULATING EXPRESSION OF EXOCENOUS CENES IN MANDIALIAN SYSTEMS, AND PRODUCTS RELATED THERETO
- (iii) NUMBER OF SEQUENCES: 18
- (iv) CORRESPONDENCE ADDRESS:
  - (A) ADDRESSEE: Gray Cary Ware & Freidenrich LLP
  - (B) STREET: 4365 Executive Drive, Suite 1600
  - (C) CITY: San Diego
  - (D) STATE: CA
  - (E) COUNTRY: USA
  - (F) ZIP: 92121-2189
- (v) COMPUTER READABLE FORM:
  - (A) MEDIUM TYPE: Floppy disk
  - (B) COMPUTER: IBM PC compatible
  - (C) OPERATING SYSTEM: PC-DOS/MS-DOS
  - (D) SOFTWARE Patentin Release #1.0, Version #1.25
- (vi) CURRENT APPLICATION DATA:
  - (A) APPLICATION NUMBER:
  - (B) FILING DATE:
  - (C) CLASSIFICATION:
- (vii) PRIOR APPLICATION DATA:
  - (A) APPLICATION NUMBER: 08/974,530
  - (B) FILING DATE: November 19, 1997
  - (C) CLASSIFICATION:
- (viii) ATTORNEY/ACENT INFORMATION:
  - (A) NAME: Reiter, Stephen B.
  - (B) REGISTRATION NUMBER: 31,192
  - (C) REFERENCE/DOCKET NUMBER: SALK1520-2
- (ix) TELECOMMUNICATION INFORMATION:
  - (A) TELEPHONE: 619-677-1409
  - (B) TELEFAX: 619-677-1465
- (2) INFORMATION FOR SEQ ID NO:1:
  - (i) SEQUENCE CHARACTERISTICS:
    - (A) LENGTH: 71 amino acids
    - (B) TYPE: amino acid
    - (C) STRANDEDNESS: single
    - (B) TOPOLOGY: both

- (ii) MOLECULE TYPE: protein
- (v) FRACMENT TYPE: internal

# (ti) SEQUENCE DESCRIPTION: SEQ ID NO:1:

Cys Xaa Xaa Cys Xaa Xaa Asp Xaa Ala Xaa Gly Xaa Tyr Xaa Xaa Xaa 1 5 10 15

Xaa Cys Xaa Xaa Cys Lys Xaa Phe Phe Xaa Arg Xaa Xaa Xaa Xaa Xaa Xaa 20 25 30

Xaa Xaa Xaa Lye Xaa Xaa Arg Xaa Xaa Cye Xaa Xaa Cye Arg Xaa Xaa 50 55 60

Lys Cys Xaa Xaa Xaa Gly Het

#### (2) INFORMATION FOR SEQ ID NO:2:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 5 amino acids
  - (B) TYPE: amino acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: unknown
- (ii) MOLECULE TYPE: peptide
- (v) FRACMENT TYPE: internal

# (xi) SEQUENCE DESCRIPTION: SEQ ID NO:2:

Clu Cly Cys Lys Cly

#### (2) INFORMATION FOR SEQ ID NO:3:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 5 amino acids
  - (B) TYPE: amino acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: unknown
- (ii) HOLECULE TYPE: peptide
- (v) FRAGMENT TYPE: internal

# (xi) SEQUENCE DESCRIPTION: SEQ ID NO:3: Gly Ser Cys Lys Val 5 (2) INFORMATION FOR SEQ ID NO:4: (i) SEQUENCE CHARACTERISTICS: (A) LENGTH: 2241 base pairs (B) TYPE: nucleic acid (C) STRANDEDNESS: both (D) TOPOLOGY: both (ii) HOLECULE TYPE: cDNA (ix) FEATURE: (A) NAME/KEY: CDS (B) LOCATION: 1..2241 (D) OTHER INFORMATION: /product = "VgEcR" (ci) SEQUENCE DESCRIPTION: SEQ ID NO:4: ATG GCC CCC CCG ACC GAT GTC AGC CTG GGG GAC GAG CTC CAC TTA GAC Met Ala Pro Pro Thr Asp Val Ser Leu Gly Asp Glu Leu His Leu Asp 5 10 15 GGC GAC GAC GTG GCG ATG GCC GAT GCC GAC GCG CTA GAC GAT TTC GAT Cly Clu Asp Val Ala Het Ala His Ala Asp Ala Leu Asp Asp Phe Asp CTG GAC ATG TTG GGG GAC GGG GAT TCC CCG GGT CCG GGA TTT ACC CCC Leu Asp Het Leu Gly Asp Gly Asp Ser Pro Gly Pro Gly Phe Thr Pro CAC GAC TCC GCC CCC TAC GGC GCT CTG GAT ATG GCC GAC TTC GAG TTT His Asp Ser Ala Pro Tyr Gly Ala Leu Asp Met Ala Asp Phe Glu Phe GAG CAG ATG TIT ACC GAT GCC CIT GGA ATT GAC GAG TAC GCT GGG AAG Glu Clo Het Phe Thr Asp Ala Leu Gly De Asp Clu Tyr Gly Gly Lys CTT CTA GGT ACC TCT AGA AGG ATA TCG AAT TCT ATA TCT TCA GGT CGC Leu Leu Gly Thr Ser Arg Arg Ile Ser Asn Ser Ile Ser Ser Gly Arg 95 GAT GAT CTC TCG CCT TCG AGC AGC TTG AAC GGA TAC TCG GCG AAC GAA

ASP ASP Leu Ser Pro Ser Ser Ser Leu ASR Gly Tyt Ser Ala ASR Glu

110

AGC TGC GAT GCG AAG AAG AGC AAG AAG GGA CCT GCG CCA CCG GTG CAA Ser Cyr Asp Aia Lyr Lyr Ser Lyr Lyr Gly Pro Aia Pro Arg Yai Gin

125

105

120

100

| GAG GAG CTG TGC CTG GTT TGC GGC GAC AGG GCC TCC GGC TAC CAC TAC<br>Glu Glu Leu Cys Leu Yal Cys Gly Asp Arg Ala Ser Gly Tyr Ilis Tyr<br>130 135 140    | 432         |
|-------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| AAC GCC CTC ACC TGT GGA TCC TGC AAG GTG TTC TTT CGA CGC AGC GTT<br>Aso Aia Leu Thr Cys Gly Ser Cys Lys Val Phe Phe Arg Arg Ser Val<br>145 150 155 160 | 480         |
| ACG AAG AGC GCC GTC TAC TGC TGC AAG TTC GGG CGC GCC TGC GAA ATG<br>Thr Lys Ser Ala Val Tyr Cys Cys Lys Phe Gly Arg Ala Cys Glu Hed<br>165 170 175     | 528         |
| GAC ATC TAC ATC AGG CGA AAG TGT CAG GAG TGC CGC CTG AAA AAG TGC<br>Asp Net Tyt Het Arg Arg Lys Cys Gin Giu Cys Arg Leu Lys Lys Cys<br>180 185 190     | <b>5</b> 76 |
| CTC GCC GTG GGT ATG CGG CCG GAA TGC GTC GTC CCG GAG AAC CAA TGT<br>Leu Ala Yal Gly Met Arg Pro Glu Cys Yal Yal Pro Glu Asn Gln Cys<br>195 200 205     | 624         |
| GCG ATG AAG CGG CGC GAA AAG AAG GCC CAG AAG GAG AAG GAC AAA ATG<br>Ala Net Lys Arg Arg Glu Lys Lys Ala Glu Lys Glu Lys Asp Lys Met<br>210 215 220     | 672         |
| ACC ACT TCG CCC AGC TCT CAG CAT GGC GGC AAT GGC AGC TTG GCC TCT<br>Thr Thr Ser Pro Ser Ser Gin His Gly Gly Asn Gly Ser Leu Ala Ser<br>225 230 235 240 | 720         |
| GGT GGC GGC CAA GAC TTT GTT AAG AAG GAG ATT CTT GAC CTT ATG ACA<br>Gly Gly Glo Asp Phe Val Lys Lys Glu IIe Leu Asp Leu Met Thr<br>245 250 255         | 768         |
| TGC GAG CCC CCC CAG CAT GCC ACT ATT CCG CTA CTA CCT GAT GAA ATA<br>Cys Glu Pro Pro Glu His Ala Thr Ile Pro Leu Leu Pro Asp Glu Ile<br>260 265 270     | 816         |
| TTG GCC AAG TGT CAA GCG CGC AAT ATA CCT TCC TTA ACG TAC AAT CAG<br>Leu Ala Lys Cys Gin Ala Arg Asn Ile Pro Ser Leu Thr Tyr Asn Gin<br>275 280 285     | 864         |
| TTG GCC GTT ATA TAC AAG TTA ATT TGG TAC CAG GAT GGC TAT GAG CAG<br>Leu Ala Val Ile Tyt Lyb Leu Ile Trp Tyt Gin Asp Giy Tyt Giu Gin<br>290 295 300     | 912         |
| CCA TCT GAA GAG GAT CTC AGG CGT ATA ATG AGT CAA CCC GAT GAG AAC<br>Pro Ser Giu Giu Asp Leu Arg Arg Ile Hei Ser Giu Pro Asp Giu Asn<br>305 310 315 320 | 960         |
| GAG AGC CAA ACG GAC GTC AGC TTT CGG CAT ATA ACC GAG ATA ACC ATA<br>Glu Ser Gin Tur Asp Val Ser Phe Arg His IIe Tur Glu IIe Tur IIe<br>325 330 335     | 8001        |
| CTC ACC CTC CAG TTG ATT CTT GAG TTT GCT AAA GGT CTA CCA GCG TTT<br>Leu Thr Yal Gin Leu Ile Yal Giu Phe Ala Lys Gly Leu Pro Ala Phe<br>340 345 350     | 1056        |

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| ACA AAG ATA CCC CAG GAG GAC CAG ATC ACC TTA CTA AAG GCC TCC TCG<br>Tor Lys IIe Pro Gin Giu Asp Gin IIe Thr Leu Leu Lys Aia Cys Ser<br>355 360 365                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1104 |
| •                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |      |
| TCG GAG GTG ATG ATG CTG CGT ATG GCA CGA CGC TAT GAC CAC AGC TCG<br>Ser Glu Yal Met Met Leu Arg Met Ala Arg Arg Tyr Asp His Ser Ser<br>370 375 380                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1152 |
| 010 mg 1 mg mg mg 000 1 m 1 m 1 m 1 m 1 m 1 m 1 m 1 m 1 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |      |
| GAC TCA ATA TTC TTC GCG AAT AAT AGA TCA TAT ACG CGG GAT TCT TAC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 1200 |
| Asp Ser Ile Phe Phe Aia Asn Asn Arg Ser Tyr Thr Arg Asp Ser Tyr                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |      |
| <b>385 390 395 400</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |      |
| AAA ATG GCC GGA ATG GCT GAT AAG ATT GAA GAC GTG CTG CAT TTC TGC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 1248 |
| Lys Met Ala Gly Met Ala Asp Asn Ile Glu Asp Leu Leu His Phe Cys                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |      |
| 405 410 415                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |      |
| CCC CAA ATC TTC TCC ATC AAG CTC GAC AAC GTC GAA TAC GCG CTT CTC<br>Arg Gin Met Phe Ser Met Lys Val Asp Asn Val Giu Tyr Ala Leu Leu                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 1296 |
| 420 425 430                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |      |
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| ACT GCC ATT GTG ATC TTC TCG GAC CGG CCG GGC CTG GAG AAG GCC CAA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 1344 |
| Thr Ala Ne Val lie Phe Ser Asp Arg Pro Gly Leu Glu Lys Ala Glu                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 1014 |
| 435 440 445                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |      |
| 110 110                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |      |
| CTA GTC GAA GCC ATC CAG AGC TAC TAC ATC GAC ACG CTA CGC ATT TAT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 1392 |
| Leu Yal Ciu Ala Ile Cin Ser Tyr Tyr ile Asp Thr Leu Arg ile Tyr                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 1932 |
| 450 455 460                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |      |
| 190 499 400                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |      |
| ATA CTC AAC CCC CAC TGC GGC GAC TCA ATG AGC CTC GTC TTC TAC GCA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 1440 |
| Ne Leu Asn Arg His Cys Gly Asp Ser Met Ser Leu Val Phe Tyr Ala                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 1440 |
| 465 470 475 480                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |      |
| 100 110 110 100                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |      |
| AAG CTG CTC TCG ATC CTC ACC GAG CTG CCT ACG CTG GGC AAC CAG AAC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 1488 |
| Lys Leu Leu Ser Ile Leu Thr Glu Leu Arg Thr Leu Gly Asn Gln Asn                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 1400 |
| 485 490 495                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |      |
| 409 430 439                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |      |
| CCC GAG ATC TCT TTC TCA CTA AAG CTC AAA AAC CEC AAA CTC CCC AAG                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 1590 |
| Ala Clu Mei Cys Phe Ser Leu Lys Leu Lys Asn Arg Lys Leu Pro Lys                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 1536 |
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| 500 505 510                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |      |
| TTC CTC GAG GAG ATC TGG GAC GTT CAT GCC ATC CCG CCA TCC GTC CAG                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 4504 |
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| Pbe Leu Glu Glu Ile Trp Asp Val His Ala Ile Pro Pro Scr Val Gin<br>515 520 525                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |      |
| 515 520 525                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |      |
| TOTO CALL CALL CALL TALL TOO OTO OTO OTO OTO OTO OCON OLO OCON OLO                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 1000 |
| TCG CAC CTT CAG ATT ACC CAG GAG GAG AAC CAG CCT CTC GAG CCG GCT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 1632 |
| Ser His Leu Glu Ile Thr Glu Glu Asn Glu Arg Leu Glu Arg Ala<br>530 535 540                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |      |
| 530 535 540                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |      |
| CTC Con 1200 con turn cum one one one 1200 con con 1200 c | 1000 |
| CAG COT ATC COG GCA TOG CITT GCG CCC CCC ATT ACC CCC CGC ATT GAT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 1680 |
| Glu Arg Met Arg Ala Ser Yal Gly Gly Ala Ile Thr Ala Gly Ile Asp<br>545 550 555 560                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |      |
| 545 550 555 560                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |      |
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| Cys Asp Ser Ala Ser Thr Ser Ala Ala Ala Ala Ala Gln His Gln                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |      |
| 565 570 575                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |      |
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CCT CAG CCT CAG CCC CAG CCC CAA CCC TCC TCC CTC ACC CAG AAC GAT 1776 Pro Gin Pro Gin Pro Gin Pro Gin Pro Ser Ser Leu Tur Gin Asn Asp 580 585 TOC CAG CAG CAG ACA CAG COG CAG CTA CAA COT CAG CTA CCA COT CAG Ser Gln His Gln Thr Gln Pro Gln Leu Gln Pro Gln Leu Pro Pro Gln 595 605 CTC CAA GGT CAA CTG CAA CCC CAG CTC CAA CCA CAG CTT CAG ACG CAA 1872 Leu Gin Gly Gin Leu Gin Pro Gin Leu Gin Pro Gin Leu Gin Thr Gin 615 620 CTC CAG CCA CAG ATT CAA CCA CAG CCA CAG CTC CTT CCC GTC TCC GCT Leu Gin Pro Gin Ile Gin Pro Gin Pro Gin Leu Leu Pro Val Ser Ala 630 635 640 CCC GTG CCC GCC TCC GTA ACC GCA CCT GGT TCC TTG TCC GCG GTC AGT 1968 Pro Val Pro Ala Ser Val Thr Ala Pro Gly Ser Leu Ser Ala Val Ser 645 650 655 ACC ACC AGC GAA TAC ATG GGC GGA ACT GCG GCC ATA GGA CCC ATC ACG Thr Ser Ser Clu Tyr Met Gly Gly Ser Ala Ala Ile Gly Pro Ile Thr 660 665 670 CCG GCA ACC ACC AGC AGT ATC ACG GCT GCC GTT ACC GCT AGC TCC ACC 2061 Pro Ala Thr Thr Ser Ser lie Thr Ala Ala Val Thr Ala Ser Ser Thr 675 685 ACA TCA GCG GTA CCG ATG GGC AAC GGA GTT GGA GTC GGT GTT GGG GTG 2112 Thr Ser Ala Val Pro Met Gly Asn Gly Val Gly Val Gly Val Gly Val 690 695 700 GGC GGC AAC GTC AGC ATG TAT GCG AAC GCC CAG ACG GCG ATG GCC TTG 2160 Gly Gly Asn Val Ser Met Tyr Ala Asn Ala Gin Thr Ala Het Ala Leu 710 715 720 ATC GGT GTA GCC CTG CAT TCG CAC CAA GAG CAG CTT ATC GGG GGA GTG 2208 Het Cly Val Ala Leu His Ser His Gln Glu Cln Leu He Gly Gly Val 725 730 735 GCG GTT AAG TCG GAG CAC TCG ACG ACT GCA TAG 2241 Ala Val Lys Ser Glu His Ser Thr Thr Ala

## (2) INFORMATION FOR SEQ ID NO:5:

740

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 746 amino acids
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear
- (ii) MOLECULE TYPE: protein
- (xi) SEQUENCE DESCRIPTION: SEQ ID NO:5:

Het Ala Pro Pro Thr Asp Val Ser Leu Gly Asp Glu Leu His Leu Asp 5 10 15 Gly Glu Asp Val Ala Met Ala His Ala Asp Ala Leu Asp Asp Phe Asp 25 Leu Asp Met Leu Gly Asp Gly Asp Ser Pro Gly Pro Gly Phe Thr Pro 40 His Asp Ser Ala Pro Tyr Gly Ala Leu Asp Met Ala Asp Phe Glu Phe Glu Glu Het Phe Thr Asp Ala Leu Gly He Asp Glu Tyr Gly Gly Lys 75 70 Leu Leu Gly Thr Ser Arg Arg Ile Ser Asn Ser Ile Ser Ser Gly Arg 90 Asp Asp Leu Ser Pro Ser Ser Ser Leu Asn Cly Tyt Ser Ala Asn Clu 100 105 Ser Cys Asp Ala Lys Lys Ser Lys Lys Gly Pro Ala Pro Arg Val Gln 120 125 Glu Glu Leu Cys Leu Val Cys Gly Asp Arg Ala Ser Gly Tyr His Tyr . 135 140 Asn Ala Leu Thr Cys Cly Ser Cys Lys Val Phe Phe Arg Arg Ser Val 145 150 155 Thr Lys Ser Ala Val Tyr Cys Cys Lys Phe Gly Arg Ala Cys Glu Het 170 Asp Net Tyr Met Arg Arg Lys Cys Gin Giu Cys Arg Leu Lys Lys Cys 180 185 Leu Ala Val Gly Met Arg Pro Glu Cys Val Val Pro Glu Asn Gln Cys 200 205 Ala Met Lys Arg Arg Glu Lys Lys Ala Glu Lys Glu Lys Asp Lys Met 215 Thr Thr Ser Pro Ser Ser Gln His Gly Gly Asn Gly Ser Leu Ala Ser 225 230 235 Cly Cly Cln Asp Phe Val Lys Lys Clu lie Leu Asp Leu Mct Thr 245 250 255 Cys Glu Pro Pro Gln His Ala Thr Ile Pro Leu Leu Pro Asp Glu Ile 265 Leu Ala Lys Cys Gin Ala Arg Asn Ile Pro Ser Leu Thr Tyr Asn Gin 275 - 280

Leu Ala Val Ile Tyr Lys Leu Ile Trp Tyr Gin Asp Gly Tyr Glu Gin

300

295

Pro Ser Glu Glu Asp Leu Arg Arg Ile Met Ser Gln Pro Asp Glu Asn 305 310 315 320

Glu Ser Gln Thr Asp Vai Ser Phe Arg His He Thr Glu He Thr He 325 330 335

Leu Thr Yai Gin Leu lie Yai Giu Phe Ala Lys Giy Leu Pro Ala Phe 340 345 350

Thr Lys lie Pro Gin Giu Asp Gin lie Thr Leu Leu Lys Ala Cys Ser 355 360 365

Ser Glu Val Met Met Leu Arg Met Ala Arg Arg Tyr Asp Nis Ser Ser 370 375 380

Asp Ser Ile Phe Phe Ala Asm Asm Arg Ser Tyr Thr Arg Asp Ser Tyr 385 390 395 400

Lys Met Ala Gly Met Ala Asp Asn Ile Glu Asp Leu Leu His Phe Cys 405 410 415

Arg Gin Met Phe Ser Met Lys Val Asp Asn Val Giu Tyr Ala Leu Leu 420 425 430

Thr Ala De Vai He Phe Ser Asp Arg Pro Gly Leu Glu Lys Ala Gln 435 440 445

Leu Val Glu Ala Ile Glu Ser Tyr Tyr Ile Asp Thr Leu Arg Ile Tyr 450 455 460

lle Leu Asn Arg His Cys Gly Asp Ser Het Ser Leu Val Phe Tyr Ala 465 470 475 480

Lys Leu Leu Ser lle Leu Thr Glu Leu Arg Thr Leu Gly Asn Gln Asn 485 490 495

Ala Glu Mei Cys Phe Ser Leu Lys Leu Lys Asn Arg Lys Leu Pro Lys 500 505 510

Phe Leu Glu Glu Ile Trp Asp Val His Ala Ile Pro Pro Ser Val Gln 515 520 525

Ser His Leu Gin Ne Tur Gin Glu Glu Asn Glu Arg Leu Glu Arg Ala 530 535 540

Glu Arg Het Arg Ala Ser Val Gly Gly Ala Ile Thr Ala Gly Ile Asp 545 550 555 560

Cys Asp Ser Ala Ser Thr Ser Ala Ala Ala Ala Ala Ala Cin His Cin 565 570 575

Pro Gln Pro Gln Pro Gln Pro Gln Pro Ser Ser Leu Thr Gln Asn Asp 580 585 590

Ser Gla His Gla Thr Gla Pro Gla Leu Gla Pro Gla Leu Pro Pro Gla

595

600

605

Leu Gin Gly Gin Leu Gin Pro Gin Leu Gin Pro Gin Leu Gin Thr Gin 610 615 620

Leu Gln Pro Gln Ile Gln Pro Gln Pro Gln Leu Leu Pro Yal Scr Ala 625 630 635 640

Pro Val Pro Ala Ser Val Tur Ala Pro Gly Ser Leu Ser Ala Val Ser 645 650 655

The Ser Ser Glu Tyr Het Gly Gly Ser Ala Ala IIe Gly Pro IIe The

Pro Ala Thr Tur Ser Ser lle Thr Ala Ala Val Thr Ala Ser Ser Thr 675 680 685

Thr Ser Ala Val Pro Met Gly Asn Gly Val Gly Val Gly Val Gly Val 690 695 700

Gly Gly Asn Val Ser Met Tyr Ala Asn Ala Gln Thr Ala Met Ala Leu 705 710 715 720

Met Gly Val Ala Leu Ilis Ser His Gln Glu Gln Leu Ile Gly Gly Val 725 730 735

Ala Val Lys Ser Glu His Ser Tur Tur Ala 740 745

#### (2) INFORMATION FOR SEQ ID NO:6:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 2241 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: both
  - (D) TOPOLOGY: both

#### (ii) MOLECULE TYPE: cDNA

- (ix) FEATURE:
  - (A) NAME/KEY: CDS
  - (B) LOCATION: 1..2241
  - (D) OTHER INFORMATION: /product = "VpEcR"

#### (xi) SEQUENCE DESCRIPTION: SEQ ID NO:6:

ATG GCC CCC CCG ACC GAT GTC AGC CTG GGG GAC GAG CTC CAC TTA GAC

Met Ala Pro Pro Thr Asp Val Ser Leu Gly Asp Glu Leu His Leu Asp

1 5 10 15

GGC GAC GAC GTG GCG ATG GCG CAT GCC GAC GCG CTA GAC GAT TTC GAT

96
Gly Glu Asp Yal Ala Mei Ala His Ala Asp Ala Leu Asp Asp Phe Asp

| CTC GAC ATC TTC GGG GAC GGG GAT TCC CCC GGT CCG GGA TTT ACC CCC<br>Leu Asp Mel Leu Ciy Asp Giy Asp Ser Pro Giy Pro Giy Phe Thr Pro<br>35 40 45        | 144          |
|-------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| CAC GAC TOO GOO COO TAC GGC GOT CTG GAT ATG GOO GAC TTC GAG TTT<br>His Asp Ser Ala Pro Tyr Gly Ala Leu Asp Het Ala Asp Phe Glu Phe<br>50 55 60        | 192          |
| GAG CAG ATG TTT ACC GAT GCC CTT GGA ATT GAC GAG TAC GCT GGG AAG<br>Clu Gln Met Phe Thr Asp Ala Leu Gly IIe Asp Glu Tyr Gly Gly Lys<br>65 70 75 80     | 240          |
| CTT CTA GGT ACC TCT AGA AGG ATA TCC AAT TCT ATA TCT TCA GGT CCC<br>Leu Leu Gly Thr Ser Arg Arg Ile Ser Aso Ser Ile Ser Ser Gly Arg<br>85 90 95        | 288          |
| GAT GAT CTC TCG CCT TCG AGC AGC TTG AAC GGA TAC TCG GCG AAC GAA<br>Asp Asp Leu Ser Pro Ser Ser Ser Leu Asn Gly Tyr Ser Ala Asn Glu<br>100 105 110     | 336          |
| AGC TGC GAT GCG AAG AAG AGC AAG AAG GGA CCT GCG CCA CGG GTG CAA<br>Ser Cys Asp Ala Lys Lys Ser Lys Lys Gly Pro Ala Pro Arg Val Gin<br>115 120 125     | 384          |
| GAG CAG CTG TGC CTC GTT TGC GGC GAC AGG GCC TGC GGC TAC CAC TAC<br>Glu Glu Leu Cys Leu Val Cys Gly Asp Arg Ala Ser Gly Tyt His Tyt<br>130 135 140     | 432          |
| AAC GCC CTC ACC TGT GAG GGC TGC AAG GGG TTC TTT CGA CGC AGC GTT<br>Aso Ala Leu Thr Cys Glu Gly Cys Lys Gly Phe Phe Arg Arg Ser Val<br>145 150 155 160 | 480          |
| ACE AAG AGC GCC GTC TAC TGC TGC AAG TTC GGG CGC GCC TGC GAA ATC<br>Thr Lys Ser Ala Val Tyr Cys Cys Lys Phe Gly Arg Ala Cys Glu Met<br>165 170 175     | 528          |
| GAC ATG TAC ATG AGG CCA AAG TGT CAG GAG TGC CGC CTG AAA AAG TGC<br>Asp Het Tyt Het Arg Arg Lys Cys Gin Giu Cys Arg Leu Lys Lys Cys<br>180 185 190     | <b>576</b> . |
| CTC GCC GTG GGT ATC CGG CCC GAA TGC GTC GTC CCC GAG AAC CAA TGT<br>Leu Ala Yal Gly Het Arg Pro Glu Cys Yal Yal Pro Glu Asn Gln Cys<br>195 200 205     | 624          |
| GCC ATG AAG CGG CGC GAA AAG AAG GCC CAG AAG GAG AAG GAC AAA ATG<br>Ala Hel Lys Arg Arg Glu Lys Lys Ala Glu Lys Glu Lys Asp Lys Net<br>210 215 220     | 672          |
| ACC ACT TCC CCC AGC TCT CAG CAT GGC GGC AAT GGC AGC TTC GCC TCT<br>Thr Thr Ser Pro Ser Ser Gin His Gly Gly Asn Gly Ser Leu Ala Ser<br>225 230 235 240 | 720          |
| GGT GGC GGC CAA GAC TTT GTT AAG AAG GAG ATT CTT GAC CTT ATG ACA<br>Gly Gly Gly Gin Asp Phe Yal Lys Lys Glu lie Leu Asp Leu Met Thr<br>245 250 255     | 768          |

| TGC CAG CCC CAG CAT GCC ACT ATT CCG CTA CTA CCT GAT GAA ATA<br>Cys Glu Pro Pro Gln His Ala Thr Ile Pro Leu Leu Pro Asp Glu Ile<br>260 265 270         | 816  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| TTG GCC AAG TGT CAA GCG CGC AAT ATA CCT TCC TTA ACG TAC AAT CAG<br>Leu Ala Lys Cys Gin Ala Arg Asn Ile Pro Ser Leu Thr Tyr Asn Gin<br>275 280 285     | 864  |
| TTG GCC GTT ATA TAC AAG TTA ATT TGG TAC CAG GAT GGC TAT GAG CAG<br>Leu Ala Yal Ile Tyt Lys Leu Ile Trp Tyt Gin Asp Gly Tyt Glu Gin<br>290 295 300     | 912  |
| CCA TCT GAA GAG GAT CTC AGG CGT ATA ATG AGT CAA CCC GAT GAG AAC<br>Pro Ser Giu Giu Asp Leu Arg Arg Iie Met Ser Gin Pro Asp Giu Asn<br>305 310 315 320 | 960  |
| GAG AGC CAA ACG GAC GTC AGC TTT CGG CAT ATA ACC GAG ATA ACC ATA<br>Glu Ser Gln Thr Asp Yal Ser Phe Arg His He Thr Glu He Thr He<br>325 330 335        | 1008 |
| CTC ACG CTC CAG TTG ATT GTT GAG TTT GCT AAA GGT CTA CCA GCG TTT<br>Leu Thr Val Glo Leu Ile Val Glu Phe Ala Lys Gly Leu Pro Ala Phe<br>340 345 350     | 1056 |
| ACA AAG ATA CXC CAG GAG GAC CAG ATC ACG TTA CTA AAG GCC TGC TCG<br>Tur Lys lie Pro Gin Giu Asp Gin lie Tur Leu Leu Lys Ala Cys Ser<br>355 360 365     | 1104 |
| TCC GAG GTG ATG ATG CTG CGT ATG GCA CGA CGC TAT GAC CAC AGC TCC<br>Ser Glu Val Het Het Leu Arg Met Ala Arg Arg Tyr Asp His Ser Ser<br>370 375 380     | 1152 |
| GAC TCA ATA TTC TTC GCC AAT AAT AGA TCA TAT ACG CGG GAT TCT TAC<br>Asp Ser IIe Phe Phe Ala Ash Ash Ash Ser Tyr Thr Arg Asp Ser Tyr<br>385 390 395 400 | 1200 |
| AAA ATG GCC GGA ATG GCT GAT AAC ATT GAA GAC CTG CTG CAT TTC TGC<br>Lys Mel Ala Cly Mel Ala Asp Asn Ile Glu Asp Leu Leu His Phe Cys<br>405 410 415     | 1248 |
| CGC CAA ATG TTC TCG ATG AAG GTG GAC AAC GTC GAA TAC GCG CTT CTC<br>Arg Gin Met Phe Ser Het Lys Val Asp Asn Val Giu Tyr Aia Leu Leu<br>420 425 430     | 1296 |
| ACT GCC ATT GTG ATC TTC TCG GAC CGG CCG GGC CTG GAG AAG GCC CAA<br>Tur Ala De Val Ne Phe Ser Asp Arg Pro Gly Leu Glu Lys Ala Glu<br>435 440 445       | 1314 |
| CTA GTC GAA GCG ATC CAG AGC TAC TAC ATC GAC ACG CTA CGC ATT TAT<br>Leu Val Giu Aia Ile Gin Ser Tyr Tyr Ile Asp Thr Leu Arg Ile Tyr<br>450 455 460     | 1392 |
| ATA CTC AAC CGC CAC TGC GGC GAC TCA ATG AGC CTC GTC TTC TAC GCA<br>lie Leu Asn Arg His Cys Gly Asp Ser Met Ser Leu Val Phe Tyr Ala<br>465 470 475 480 | 1440 |

| AAG CTG CTC TCG ATC CTC ACC GAG CTG CCT ACG CTG GGC AAC CAG AAC Lys Leu Leu Ser lie Leu Thr Giu Leu Arg Thr Leu Giy Asn Gin Asn 485 490 495              | 8  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|----|
| GCC GAG ATG TGT TTC TCA CTA AAG CTC AAA AAC CGC AAA CTG CCC AAG 153<br>Ala Glu Hei Cys Phe Ser Leu Lys Leu Lys Asn Arg Lys Leu Pro Lys<br>500 505 510    | 6  |
| TTC CTC GAG GAG ATC TGG GAC CTT CAT GCC ATC CCG CCA TCG GTC CAG 158 Pbe Leu Glu Glu Ile Trp Asp Val His Ala Ile Pro Pro Ser Val Gln 515 520 525          | И  |
| TCC CAC CTT CAG ATT ACC CAG GAG GAG AAC GAG CCT CTC GAG CCG CCT 168<br>Ser His Leu Glu Ile Tur Glu Glu Asu Glu Arg Leu Glu Arg Ala<br>530 535 540        | 32 |
| GAG CCT ATC CCC GCA TCC GTT GGG GGC GCC ATT ACC GCC GGC ATT GAT 16<br>Glu Arg Net Arg Ala Ser Val Gly Gly Ala Ile Thr Ala Gly Ile Asp<br>545 550 555 560 | 80 |
| TGC GAC TCT GCC TCC ACT TCC GCG GCC GCA GCC GCC GCC CAG CAT CAG 1720<br>Cyr Asp Ser Ala Ser Thr Ser Ala Ala Ala Ala Ala Ala Gln His Gln<br>565 570 575   | 8  |
| CCT CAG CCT CAG CCC CAG CCC CAA CCC TCC CTC ACC CAG AAC GAT Pro Gin Pro Gin Pro Gin Pro Ser Ser Leu Thr Gin Asn Asp 580 585 590                          |    |
| TCC CAG CAC CAG ACA CAG CCC CAG CTA CAA CCT CAG CTA CCA CCT CAG Ser Gin His Gin Thr Gin Pro Gin Leu Gin Pro Gin Leu Pro Pro Gin 595 600 605              |    |
| CTG CAA GGT CAA CTG CAA CCC CAG CTC CAA CCA CAG CTT CAG ACG CAA 1872<br>Leu Gin Giy Gin Leu Gin Pro Gin Leu Gin Pro Gin Leu Gin Thr Gin<br>610 615 620   |    |
| CTC CAG CCA CAG ATT CAA CCA CAG CCA CAG CTC CTT CCC GTC TCC GCT  Leu Gin Pro Gin Ile Gin Pro Gin Pro Gin Leu Leu Pro Yai Ser Ala 625 630 635 640         | ,  |
| CCC GTG CCC GCC TCC GTA ACC GCA CCT GGT TCC TTG TCC GCG GTC AGT 1968 Pro Val Pro Ala Ser Val Tur Ala Pro Gly Ser Leu Ser Ala Val Ser 645 650 655         | }  |
| ACC AGC AGC CAA TAC ATG GGC GGA AGT GCG GCC ATA GGA CCC ATC ACG  Thr Ser Ser Glu Tyr Met Gly Gly Ser Ala Ala Ile Gly Pro Ile Thr  660 665 670            | 6  |
| CCC GCA ACC ACC AGC AGT ATC ACC GCT GCC GTT ACC GCT AGC TCC ACC  Pro Ala Thr Thr Ser Ser Ile Thr Ala Ala Val Thr Ala Ser Ser Thr 675 680 685             | •  |
| ACA TCA GCC GTA CCC ATC GGC AAC GGA GTT GGA GTC GGT GTT GGG GTC  Thr Ser Ala Yai Pro Met Gly Asn Cly Yai Gly Yai Gly Yai Gly Yai Gly Yai  690 695 700    | 12 |

GGC GGC AAC GTC AGC ATG TAT GCG AAC GCC CAG ACG GCG ATG GCC TTG Gly Gly Asn Val Ser Met Tyr Ala Asn Ala Gln Thr Ala Met Ala Leu 715 720 ATC GGT GTA GCC CTG CAT TCG CAC CAA GAG CAG CTT ATC GGG GGA GTG Het Gly Val Ala Leu His Ser Ilis Gln Glu Gln Leu Ile Gly Gly Val 725 730 735 GCG GTT AAG TCG GAG CAC TCG ACG ACT GCA TAG 2241 Ala Val Lys Ser Glu His Ser Thr Thr Ala 740 745 (2) INFORMATION FOR SEQ ID NO:7: (i) SEQUENCE CHARACTERISTICS: (A) LENGTH: 746 amino acids (B) TYPE: amino acid (D) TOPOLOGY: linear (ii) MOLECULE TYPE: protein (xi) SEQUENCE DESCRIPTION: SEQ ID NO:7: Met Ala Pro Pro Thr Asp Val Ser Leu Gly Asp Glu Leu His Leu Asp 10 1 5 15 Gly Glu Asp Val Ala Met Ala His Ala Asp Ala Leu Asp Asp Phe Asp 25 Leu Asp Met Leu Gly Asp Gly Asp Ser Pro Gly Pro Gly Phe Thr Pro 40 His Asp Ser Ala Pro Tyr Gly Ala Leu Asp Met Ala Asp Phe Glu Phe 55 60 Giu Gin Met Phe Thr Asp Ala Leu Gly Ile Asp Giu Tyr Gly Gly Lys 75 Leu Leu Gly Thr Ser Arg Arg Ile Ser Asn Ser Ile Ser Ser Gly Arg 90 Asp Asp Leu Ser Pro Ser Ser Ser Leu Asn Gly Tyr Ser Ala Asn Glu 105 Ser Cys Asp Ala Lys Lys Ser Lys Lys Gly Pro Ala Pro Arg Val Gln 120 Glu Glu Leu Cys Leu Val Cys Gly Asp Arg Ala Ser Gly Tyr His Tyr 130 135 Asn Ala Leu Thr Cys Glu Gly Cys Lys Gly Phe Phe Arg Arg Ser Val 150 155 160

Thr Lys Ser Ala Val Tyr Cys Cys Lys Phe Gly Arg Ala Cys Glu Met

165 170 175

Asp Met Tyr Met Arg Arg Lys Cys Gin Glu Cys Arg Leu Lys Lys Cys 180 185 190

Leu Ala Yal Gly Met Arg Pro Glu Cys Yal Yal Pro Glu Asn Gln Cys 195 200 205

Ala Met Lys Arg Arg Glu Lys Lys Ala Glu Lys Glu Lys Asp Lys Met 210 215 220

Thr Thr Ser Pro Ser Ser Gln His Gly Gly Asn Gly Ser Leu Ala Ser 225 230 235 240

Gly Gly Gln Asp Phe Val Lys Lys Glu IIe Leu Asp Leu Met Thr 245 250 255

Cys Glu Pro Pro Gln His Ala Thr Ile Pro Leu Leu Pro Asp Glu Ile 260 265 270

Leu Ala Lys Cys Gin Ala Arg Asn Ile Pro Ser Leu Tur Tyr Asn Gin 275 280 285

Leu Ala Val Ile Tyr Lys Leu Ile Trp Tyr Gin Asp Gly Tyr Glu Cin 290 295 300

Pro Ser Glu Glu Asp Leu Arg Arg Ile Het Ser Gln Pro Asp Glu Asn 305 310 315 320

Glu Ser Gln Thr Asp Val Ser Phe Arg His Ile Thr Glu Ile Thr Ile 325 330 335

Leu Tur Yal Gln Leu Ile Val Glu Phe Ala Lys Gly Leu Pro Ala Phe 340 345 350

Thr Lys Ne Pro Gln Glu Asp Gln Ne Thr Leu Leu Lys Ala Cys Ser 355 360 365

Ser Glu Val Het Het Leu Arg Met Ala Arg Arg Tyr Asp Ilis Ser Ser 370 375 380

Asp Ser IIe Phe Phe Ala Asn Asn Arg Ser Tyr Thr Arg Asp Ser Tyr 385 390 395 400

Lys Het Ala Cly Met Ala Asp Aso Ile Glu Asp Leu Leu His Phe Cys 405 410 415

Arg Cln Met Phe Ser Met Lys Vai Asp Asn Val Clu Tyr Ala Leu Leu 420 425 430

Thr Ala IIe Val IIe Phe Ser Asp Arg Pro Gly Leu Glu Lys Ala Glu 435 440 445

Leu Val Glu Ala Ile Gln Ser Tyr Tyr Ile Asp Thr Leu Arg Ile Tyr 450 455 460

lle Leu Asn Arg His Cys Gly Asp Ser Het Ser Leu Val Phe Tyr Ala Lys Leu Leu Ser lie Leu Thr Giu Leu Arg Thr Leu Giy Asn Gin Asn Ala Glu Het Cys Phe Ser Leu Lys Leu Lys Asn Arg Lys Leu Pro Lys Phe Leu Glu Glu lle Trp Asp Yal His Ala Ile Pro Pro Ser Val Gln Ser His Leu Gln He Thr Gln Glu Glu Asn Glu Arg Leu Glu Arg Ala Clu Arg Met Arg Ala Ser Val Cly Cly Ala Ile Thr Ala Cly Ile Asp Cys Asp Ser Ala Ser Thr Ser Ala Ala Ala Ala Ala Ala Gln Ilis Gln Pro Gin Pro Gin Pro Gin Pro Gin Pro Ser Ser Leu Thr Gin Asn Asp Ser Cln His Cln Thr Cln Pro Cln Leu Gln Pro Cln Leu Pro Pro Cln Leu Gin Giy Gin Leu Gin Pro Gin Leu Gin Pro Gin Leu Gin Thr Gin Leu Gin Pro Gin De Gin Pro Gin Pro Gin Leu Leu Pro Val Ser Ala Pro Val Pro Ala Ser Val Thr Ala Pro Gly Ser Leu Ser Ala Val Ser Thr Ser Ser Glu Tyr Het Gly Gly Ser Ala Ala Ile Gly Pro Ile Thr Pro Ala Thr Thr Ser Ser lie Thr Ala Ala Val Thr Ala Ser Ser Thr The Ser Ala Val Pro Met Gly Asn Gly Val Gly Val Gly Val Gly Val . Gly Gly Asn Val Ser Het Tyr Ala Asn Ala Gin Thr Ala Het Ala Leu Met Gly Val Ala Leu His Ser His Gln Glu Gln Leu He Gly Gly Val

Ala Val Lys Ser Glu His Ser Thr Thr Ala

# (2) INFORMATION FOR SEQ ID NO:8:

| (i) SEQUENCE CHARACTERISTICS:                                                                                                                   |     |
|-------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| (A) LENGTH: 3126 base pairs                                                                                                                     |     |
| (B) TYPE: nucleic acid                                                                                                                          |     |
| (C) STRANDEDNESS: both                                                                                                                          |     |
| (D) TOPOLOGY: both                                                                                                                              |     |
| (ii) MOLECULE TYPE: cDNA                                                                                                                        |     |
| (iz) FEATURE:                                                                                                                                   |     |
| (A) NAME/KEY: CDS                                                                                                                               |     |
| (B) LOCATION: 13126 (B) OTHER INFORMATION: /product = "GECR"                                                                                    |     |
|                                                                                                                                                 |     |
| (ci) SEQUENCE DESCRIPTION: SEQ ID NO:8:                                                                                                         |     |
| ATG GAC TOC AAA GAA TCA TTA ACT CCT GGT AGA GAA GAA AAC COC AGC<br>Het Asp Ser Lys Glu Ser Leu Thr Pro Cly Arg Glu Glu Asn Pro Ser<br>1 5 10 15 | 48  |
| AGT GTG CTT GCT CAG GAG AGG GGA GAT GTG ATG GAG TTG TAT AAA ACC                                                                                 | •   |
| Ser Val Leu Ala Gin Giu Arg Giy Asp Val Net Asp Phe Tyr Lys Thr                                                                                 | 9   |
| 20 25 30                                                                                                                                        |     |
| CTA AGA GGA GGA GCT ACT GTG AAG GTT TCT GCG TCT TCA CCC TCA CTG                                                                                 | 14  |
| Leu Arg Cly Cly Ala Thr Val Lys Val Ser Ala Ser Ser Pro Ser Leu                                                                                 |     |
| 35 40 45                                                                                                                                        |     |
| GCT GTC GCT TCT CAA TCA GAC TCC AAG CAG CEA AGA CTT TTG GTT GAT                                                                                 | 19  |
| Ala Val Ala Ser Gin Ser Asp Ser Lys Gin Arg Arg Leu Leu Val Asp                                                                                 | 13. |
| 50 55 60                                                                                                                                        |     |
| TTT 201 111 000 701 071 100 117 000 010 010 0                                                                                                   |     |
| TIT CCA AAA GGC TCA CTA AGC AAT GCG CAG CAG CCA GAT CTG TCC AAA                                                                                 | 240 |
| Pbe Pro Lys Cly Ser Val Ser Asn Ala Cln Cln Pro Asp Leu Ser Lys                                                                                 |     |
| 65 70 75 80                                                                                                                                     |     |
| GCA GTT TCA CTC TCA ATG GGA CTG TAT ATG GGA GAG ACA GAA ACA AAA                                                                                 | 28  |
| Ala Val Ser Leu Ser Met Gly Leu Tyr Met Gly Glu Thr Glu Thr Lys                                                                                 |     |
| 85 90 95                                                                                                                                        |     |
| CTC ATC GGA AAT GAC CTC GGA TTC CCA CAG GAG GGC CAA ATC AGC CTT                                                                                 | 90  |
| Val Het Gly Asn Asp Leu Gly Phe Pro Gln Gln Gly Gln lie Ser Leu                                                                                 | 33( |
| 100 105 110                                                                                                                                     |     |
| 100 100                                                                                                                                         |     |
| TOO TOO GOO GAA ACA GAC TTA AAG OTT TTO GAA GAA AGO ATT GCA AAC                                                                                 | 38  |
| Ser Ser Gly Glu Thr Asp Leu Lys Leu Leu Glu Glu Ser Ile Ala Asn                                                                                 |     |
| 115 120 125                                                                                                                                     |     |
| CTC AAT AGG TOG ACC AGT GTT OOA GAG AAC COC AAG AGT TOA GCA TOC                                                                                 | /90 |
| Leu Aso Arg Ser Thr Ser Yai Pro Giu Aso Pro Lys Ser Ser Aia Ser                                                                                 | 432 |
| 130 135 140                                                                                                                                     |     |
| 100 100                                                                                                                                         |     |

| ACT GCT GTG TCT GCC GCC GCC ACA GAG AAG GAG TTT CCA AAA ACT CAC<br>Tur Aia Yal Ser Aia Aia Pro Thr Giu Lys Giu Phe Pro Lys Thr His<br>145 150 155 160 | 480  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| TCT GAT GTA TCT TCA GAA CAG CAA CAT TTG AAG GGC CAG ACT GGC ACC<br>Ser Asp Val Ser Ser Glu Gln Gln His Leu Lys Gly Gln Thr Gly Thr<br>165 170 175     | 528  |
| AAC GCT GGC AAT GTG AAA TTG TAT ACC ACA GAC CAA AGC ACC TTT GAC<br>Asn Gly Gly Asn Val Lys Leu Tyt Thr Thr Asp Gln Ser Thr Phe Asp<br>180 185 190     | 576  |
| ATT TTG CAG GAT TTG GAG TTT TCT TCT GGG TCC CCA GGT AAA GAG ACG<br>Ne Leu Gin Asp Leu Giu Phe Ser Ser Giy Ser Pro Giy Lys Giu Thr<br>195 200 205      | 624  |
| AAT GAG AGT CCT TGG AGA TCA GAC CTC TTG ATA GAT GAA AAC TGT TTG<br>Asn Glu Ser Pro Trp Arg Ser Asp Leu Leu IIe Asp Glu Asn Cys Leu<br>210 215 220     | 672  |
| CTT TCT CCT CTC GCG GGA GAA GAC GAT TCA TTC CTT TTG GAA GGA AAC<br>Leu Ser Pro Leu Ala Cly Glu Asp Asp Ser Phe Leu Leu Glu Gly Asn<br>225 230 235 240 | 720  |
| TCC AAT GAG GAC TGC AAG CCT CTC ATT TTA CCC GAC ACT AAA CCC AAA<br>Ser Asu Glu Asp Cys Lys Pro Leu IIe Leu Pro Asp Thr Lys Pro Lys<br>245 250 255     | 768  |
| ATT AAC GAT AAT GGA GAT CTC GTT TTC TCA AGC CCC AGT AAT GTA ACA<br>Ne Lys Asp Asn Gly Asp Leu Val Leu Ser Ser Pro Ser Asn Val Tur<br>260 265 270      | 816  |
| CTG CCC CAA GTG AAA ACA GAA AAA GAA GAT TTC ATC GAA CTC TGC ACC<br>Leu Pro Giu Yai Lya Thr Giu Lya Giu Asp Phe IIe Giu Leu Cya Thr<br>275 280 285     | 864  |
| CCT GGG GTA ATT AAG CAA GAG AAA CTG GGC ACA GTT TAC TGT CAG GCA<br>Pro Gly Yai Ne Lys Gin Giu Lys Leu Cly Tur Yai Tyr Cys Gin Aia<br>290 295 300      | 912  |
| AGC TIT CCT GGA GCA AAT ATA ATT GGT AAT AAA ATG TCT GCC ATT TCT<br>Ser Phe Pro Gly Ala Aso IIe IIe Gly Aso Lys Met Ser Ala IIe Ser<br>305 310 315 320 | 960  |
| CTT CAT GGT GTG AGT ACC TCT GGA GGA CAG ATG TAC CAC TAT GAC ATG<br>Val His Gly Val Ser Thr Ser Gly Gly Gln Mel Tyt His Tyt Asp Mel<br>325 330 335     | 1008 |
| AAT ACA GCA TCC CTT TCT CAA CAG CAG GAT CAG AAG CCT ATT TTT AAT<br>Asn Thr Ala Ser Leu Ser Gin Gin Gin Asp Gin Lys Pro lie Phe Asn<br>340 345 350     | 1056 |
| CTC ATT CCA CCA ATT CCC GTT GGT TCC GAA AAT TGG AAT AGG TGC CAA<br>Val Ile Pro Pro lie Pro Val Gly Ser Glu Asn Trp Asn Arg Cys Gln<br>355 360 365     | 1101 |

| GGA TOT GGA GAT GAC AAC TTG ACT TOT GTG GGG ACT CTG AAC TTC CCT<br>Gly Ser Gly Asp Asp Asn Leu Thr Ser Leu Gly Thr Leu Asn Phe Pro<br>370 375 380     | 1152 |
|-------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| GGT CGA ACA GTT TTT TCT AAT GGC TAT TCA AGC CCC AGC ATG AGA CCA<br>Gly Arg Thr Val Phe Ser Asn Gly Tyr Ser Ser Pro Ser Met Arg Pro<br>385 390 395 400 | 1200 |
| GAT GTA AGC TUT CUT CCA TOC AGC TOC TCA ACA GCA ACA ACA GGA CCA<br>Asp Val Ser Ser Pro Pro Ser Ser Ser Ser Thr Ala Thr Thr Gly Pro<br>405 410 415     | 1248 |
| CCT CCC AGC GGC CGC GTC CAA GAG GAG CTG TGC CTG GTT TGC GGC GAC<br>Pro Pro Ser Gly Arg Val Gln Glu Glu Leu Cys Leu Val Cys Gly Asp<br>420 425 430     | 1296 |
| AGG GCC TCC GGC TAC CAC TAC AAC GCC CTC ACC TGT GGA TCC TGC AAG<br>Arg Ala Ser Gly Tyr His Tyr Asn Ala Leu Thr Cys Gly Ser Cys Lys<br>435 440 445     | 1344 |
| GTG TTC TTT CGA CGC AGC GTT ACG AAG AGC GCC GTC TAC TGC TAC AAG<br>Val Phe Phe Arg Arg Ser Val Thr Lys Ser Ala Val Tyr Cys Cys Lys<br>450 455 460     | 1392 |
| TTC GGG CGC GCC TGC GAA ATG GAC ATG TAC ATG AGG CGA AAG TGT CAG<br>Phe Gly Arg Ala Cys Glu Hel Asp Met Tyr Met Arg Arg Lys Cys Gln<br>465 470 475 480 | 1440 |
| GAG TGC CGC CTG AAA AAG TGC CTG CGC GTG GGT ATG CGG CCC GAA TGC<br>Glu Cys Arg Leu Lys Lys Cys Leu Ala Yal Gly Met Arg Pro Glu Cys<br>485 490 495     | 1488 |
| GTC GTC CCC GAG AAC CAA TGT GCC ATG AAG CCG CGC GAA AAG AAG GCC<br>Yal Yal Pro Giu Asn Gin Cys Ala Net Lys Arg Arg Giu Lys Lys Ala<br>500 505 510     | 1536 |
| CAG AAG GAG AAG GAC AAA ATG ACC ACT TCC CCC AGC TCT CAG CAT GGC<br>Gin Lys Giu Lys Asp Lys Mei Thr Thr Ser Pro Ser Ser Gin His Giy<br>515 520 525     | 1584 |
| GGC AAT GGC AGC TTG GGC TCT GGT GGC GGC CAA GAC TTT GTT AAG AAG<br>Ciy Asn Ciy Ser Leu Ala Ser Giy Giy Gin Asp Phe Vai Lys Lys<br>530 535 540         | 1632 |
| GAG ATT CIT GAC CIT ATG ACA TGC GAG CCG CCC CAG CAT GCC ACT ATT<br>Glu lle Leu Asp Leu Mei Thr Cys Glu Pro Pro Gln His Ala Thr lle<br>545 550 555 560 | 1680 |
| CCG CTA CTA CCT GAT GAA ATA TTC GCC AAG TGT CAA GCG CGC AAT ATA<br>Pro Leu Leu Pro Asp Giu IIe Leu Ala Lys Cys Gin Ala Arg Asu IIe<br>565 570 575     | 1728 |
| OCT TOC TTA ACC TAC AAT CAG TTG GCC GTT ATA TAC AAG TTA ATT TGG Pro Ser Leu Tur Tyr Asn Gin Leu Ala Val He Tyr Lys Leu He Trp 580 585 500             | 1776 |

| TAC CAG GAT GGC TAT GAG CAG CCA TCT GAA GAG GAT CTC AGG CGT ATA<br>Tyr Gio Asp Gly Tyr Gio Gio Pro Ser Gio Gio Asp Leo Arg Arg lie                    | 1824 |
|-------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| 595 600 605                                                                                                                                           |      |
| ATC AGT CAA-CCC GAT GAG AAC GAG AGC CAA ACC GAC GTC AGC TTT CGG<br>Met Ser Gin Pro Asp Giu Asn Giu Ser Gin Thr Asp Yai Ser Phe Arg<br>610 615 620     | 1872 |
| CAT ATA ACC GAG ATA ACC ATA CTC ACG GTC CAG TTC ATT GTT GAG TTT<br>His lie Thr Glu lie Thr lie Leu Thr Val Glu Leu lie Val Glu Phe<br>625 630 635 610 | 1920 |
| GCT AAA GGT CTA CCA GCG TTT ACA AAG ATA CCC CAG GAG GAC CAG ATC<br>Ala Lys Gly Leu Pro Ala Phe Thr Lys Ile Pro Gin Giu Asp Gin Ile<br>645 650 655     | 1968 |
| ACG TTA CTA AAG GCC TGC TCG TCG GAG GTG ATC ATC CTC CGT ATC GCA<br>Thr Leu Leu Lys Aia Cys Ser Ser Giu Vai Met Met Leu Arg Met Aia<br>660 665 670     | 2016 |
| CCA CCC TAT CAC CAC AGC TCG GAC TCA ATA TTC TTC GCG AAT AAT AGA<br>Arg Arg Tyr Asp His Ser Ser Asp Ser He Phe Phe Ala Asn Asn Arg<br>675 680 685      | 2064 |
| TCA TAT ACC CGG GAT TCT TAC AAA ATG GCC GGA ATG GCT GAT AAC ATT<br>Ser Tyr Thr Arg Asp Ser Tyr Lys Het Ala Gly Met Ala Asp Asn Ile<br>690 695 700     | 2112 |
| GAA GAC CTG CTG CAT TTC TGC CGC CAA ATG TTC TCG ATG AAG GTG GAC<br>Glu Asp Leu Leu His Phe Cys Arg Gln Het Phe Ser Het Lys Val Asp<br>705 710 715 720 | 2160 |
| AAC CTC GAA TAC GCC CTT CTC ACT GCC ATT GTC ATC TTC TCG GAC CGG<br>Aso Yai Giu Tyr Aia Leu Leu Thr Aia lie Yai IIe Phe Ser Asp Arg<br>725 730 735     | 2208 |
| CCC GGC CTC GAG AAG GCC CAA CTA GTC GAA GCG ATC CAG AGC TAC TAC<br>Pro Gly Leu Glu Lys Ala Gln Leu Val Glu Ala lle Gln Ser Tyr Tyr<br>740 745 750     | 2256 |
| ATC GAC ACC CTA CGC ATT TAT ATA CTC AAC CGC CAC TGC GGC GAC TCA<br>lle Asp Thr Leu Arg lle Tyr lle Leu Asn Arg His Cys Gly Asp Ser<br>755 760 765     | 2304 |
| ATG AGC CTC GTC TTC TAC GCA AAG CTG CTC TCC ATC CTC ACC GAG CTG<br>Het Ser Leu Val Phe Tyr Aia Lys Leu Leu Ser lie Leu Thr Giu Leu<br>770 775 780     | 2352 |
| CGT ACG CTG GGC AAC CAG AAC GCC GAG ATG TGT TTG TGA CTA AAG CTC<br>Arg Thr Leu Gly Asn Gln Asn Ala Glu Met Cys Phe Ser Leu Lys Leu<br>785 790 795 800 | 2400 |
| AAA AAC CGC AAA CTG CCC AAG TTC CTC GAG GAG ATC TGG GAC GTT CAT<br>Lys Asn Arg Lys Leu Pro Lys Phe Leu Glu Glu IIe Trp Asp Val His<br>805 810 815     | 2448 |

| GCC ATC CCG CCA TCG GTC CAG TCG CAC CTT CAG ATT ACC CAG GAG GAG Ala lie Pro Pro Ser Yai Gin Ser His Leu Gin Ile Thr Gin Giu Giu 820 825 830                    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| AAC GAG CGT CTC GAG CGG GCT GAG CGT ATC CGG GCA TCG CTT GGG GGC 2514 Asn Glu Arg Leu Glu Arg Ala Glu Arg Met Arg Ala Ser Val Gly Gly 835 840 845               |
| CCC ATT ACC CCC GGC ATT GAT TGC CAC TCT GCC TCC ACT TCC GCG GCG 2592 Ala Ile Thr Ala Gly Ile Asp Cy8 Asp Ser Ala Ser Thr Ser Ala Ala 850 855 860               |
| GCA GCC GCC GCC CAG CAT CAG CCT CAG CCT CAG CCC CAG CCC CAA CCC Ala Ala Ala Ala Gln His Gln Pro Gln Pro Gln Pro Gln Pro Gln Pro 865 870 875 880                |
| TCC TCC CTG ACC CAG AAC GAT TCC CAG CAG CAG ACA CAG CCC CAG CTA 2688 Ser Ser Leu Thr Gin Asn Asp Ser Gin His Gin Thr Gin Pro Gin Leu 885 890 895               |
| CAA CUT CAG CTA CCA CCT CAG CTG CAA GGT CAA CTG CAA CCC CAG CTC 2736<br>Gin Pro Gin Leu Pro Pro Gin Leu Gin Gly Gin Leu Gin Pro Gin Leu<br>900 905 910         |
| CAA CCA CAG CTT CAG ACG CAA CTC CAG CCA CAG ATT CAA CCA CAG CCA 2784<br>Glo Pro Glo Leu Glo Thr Glo Leu Glo Pro Glo IIe Glo Pro Glo Pro<br>915 920 925         |
| CAG CTC CTT CCC CTC TCC GCT CCC GTG CCC GCC TCC GTA ACC GCA CCT 2832 Glo Leu Leu Pro Yai Ser Ala Pro Vai Pro Ala Ser Vai Tur Ala Pro 930 935 940               |
| GGT TCC TTG TCC GCG GTC ACT ACG AGC AGC GAA TAC ATG GGC GGA AGT  Cly Ser Leu Ser Ala Val Ser Thr Ser Ser Glu Tyr Met Cly Gly Ser  945 950 955 960 2880         |
| GCG GCC ATA GGA CCC ATC ACC CCC GCA ACC ACC ACC AGC AGT ATC ACC GCT  2928 Ala Ala Ile Gly Pro Ile Thr Pro Ala Thr Thr Ser Ser Ile Thr Ala 965 970 975          |
| GCC GTT ACC GCT AGC TCC ACC ACA TCA GCC GTA CCC ATG GGC AAC GGA 2976<br>Ala Val Thr Ala Ser Ser Thr Thr Ser Ala Val Pro Met Gly Asn Gly<br>980 985 990         |
| GTT GGA GTC GGT GTT GGG GTG GGC GGC AAC GTC AGC ATG TAT GCG AAC Val Gly Val Gly Val Gly Gly Åsn Val Ser Mel Tyt Ala Asn 995 1000 1005                          |
| GCC CAG ACG GCC ATG GCC TTG ATG GCT GTA GCC CTG CAT TCG CAC CAA 3072<br>Ala Cin Thr Ala Mei Ala Leu Mei Ciy Yai Ala Leu His Ser His Gin<br>1010 1015 1020      |
| GAG CAC CIT ATC GGG GGA GTG GCG GTT AAC TCG GAG CAC TCC ACC ACT 3120<br>Glu Gln Leu Ile Gly Gly Val Ala Val Lys Ser Glu His Ser Thr Thr<br>1025 1030 1035 1040 |

GCA TAG Ala 3126

# (2) INFORMATION FOR SEQ ID NO:9:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 1041 amino acids
  - (B) TYPE: amino acid
  - (D) TOPOLOGY: linear
- (ii) MOLECULE TYPE: protein
- (xi) SEQUENCE DESCRIPTION: SEQ ID NO:9:

Met Asp Ser Lys Glu Ser Leu Thr Pro Gly Arg Glu Glu Asn Pro Ser 1 5 10 15

Ser Val Leu Ala Gln Glu Arg Ciy Asp Val Met Asp Phe Tyr Lys Thr 20 25 30

Leu Arg Cly Cly Ala Thr Yal Lys Yal Ser Ala Ser Ser Pro Ser Leu 35 40 45

Ala Yai Ala Ser Gin Ser Asp Ser Lys Gin Arg Arg Leu Leu Yai Asp 50 55 60

Phe Pro Lys Gly Ser Val Ser Asn Ala Gln Gln Pro Asp Leu Ser Lys 65 70 75 80

Ala Val Ser Leu Ser Het Cly Leu Tyr Het Cly Clu Thr Clu Thr Lys 85 90 95

Val Het Gly Asn Asp Leu Gly Phe Pro Gln Gln Gly Gln Ile Ser Leu 100 105 110

Ser Ser Gly Glu Tur Asp Leu Lys Leu Leu Glu Glu Ser Ile Ala Asn 115 120 125

Leu Aso Arg Ser Thr Ser Val Pro Glu Aso Pro Lya Ser Ser Ala Ser 130 135 140

The Ala Val See Ala Ala Pro The Glu Lys Glu Phe Pro Lys The His 145 150 155 160

Ser Asp Val Ser Ser Glu Gln Gln His Leu Lys Gly Gln Thr Gly Thr  $165 \hspace{1.5cm} 170 \hspace{1.5cm} 175$ 

Aso Gly Gly Aso Yai Lys Leu Tyr Thr Thr Asp Glo Ser Thr Phe Asp 180 185 190

lle Leu Gla Asp Leu Glu Phe Ser Ser Gly Ser Pro Gly Lys Glu Thr 195 200 205

Aso Glu Ser Pro Trp Arg Ser Asp Leu Leu lle Asp Glu Aso Cys Leu Leu Ser Pro Leu Ala Gly Glu Asp Asp Ser Phe Leu Leu Glu Gly Asn Ser Asn Glu Asp Cys Lys Pro Leu lle Leu Pro Asp Thr Lys Pro Lys lle Lys Asp Asn Gly Asp Leu Val Leu Ser Ser Pro Ser Asn Val Thr Leu Pro Gin Val Lys Thr Glu Lys Glu Asp Phe Ne Glu Leu Cys Thr Pro Gly Val He Lys Gln Glu Lys Leu Gly Thr Val Tyr Cys Gln Ala Ser Phe Pro Cly Ala Asn Ile Ile Cly Asn Lys Met Ser Ala Ile Ser Val His Cly Val Ser Thr Ser Cly Cly Cln Het Tyr His Tyr Asp Het Asn Thr Ala Ser Leu Ser Gin Gin Gin Asp Gin Lys Pro He Phe Asn Val He Pro Pro He Pro Val Cly Ser Clu Asn Trp Asn Arg Cys Cln Cly Ser Cly Asp Asp Asn Leu Thr Ser Leu Cly Thr Leu Asn Phe Pro Cly Arg Thr Val Phe Ser Asn Cly Tyr Ser Ser Pro Ser Het Arg Pro Asp Val Ser Ser Pro Pro Ser Ser Ser Ser Thr Ala Thr Thr Gly Pro Pro Pro Ser Cly Arg Val Cln Clu Clu Leu Cys Leu Val Cys Cly Asp Arg Ala Ser Gly Tyr His Tyr Asn Ala Leu Thr Cys Gly Ser Cys Lys Val Phe Phe Arg Arg Ser Val Thr Lys Ser Ala Val Tyr Cys Cys Lys Phe Gly Arg Ala Cys Glu Met Asp Met Tyr Met Arg Arg Lys Cys Gln 

Glu Cys Arg Leu Lys Lys Cys Leu Ala Val Gly Met Arg Pro Glu Cys

Val Val Pro Giu Asu Cin Cys Ala Met Lys Arg Arg Giu Lys Lys Ala 500 505 510

Gln Lys Glu Lys Asp Lys Met Tur Thr Ser Pro Ser Ser Gln His Gly 515 520 525

Gly Asn Cly Ser Leu Ala Ser Cly Gly Gly Gln Asp Phe Val Lys Lys 530 535 540

Glu Ile Leu Asp Leu Met Thr Cys Glu Pro Pro Gln His Ata Thr Ile 545 550 555 560

Pro Leu Leu Pro Asp Clu lle Leu Ala Lys Cys Gin Ala Arg Asn lle 565 570 575

Pro Ser Leu Thr Tyr Asn Gin Leu Ala Val Ile Tyr Lys Leu Ile Trp 580 585 590

Tyr Gin Asp Gly Tyr Glu Gin Pro Ser Glu Glu Asp Leu Arg Arg lie 595 600 605

Met Ser Gin Pro Asp Glu Asn Glu Ser Gin Thr Asp Yal Ser Phe Arg 610 615 620

His Ile Tar Glu Ile Thr Ile Leu Tar Val Gln Leu Ile Val Glu Phe 625 630 635 640

Ala Lys Gly Leu Pro Ala Phe Thr Lys He Pro Gln Glu Asp Gln He 645 650 655

Thr Leu Leu Lys Ala Cys Ser Ser Glu Val Het Het Leu Arg Het Ala 660 665 670

Arg Arg Tyr Asp His Ser Ser Asp Ser Ile Phe Phe Ala Asn Asn Arg 675 680 685

Ser Tyr Thr Arg Asp Ser Tyr Lys Hel Ala Gly Hel Ala Asp Asn He 690 695 700

Glu Asp Leu Leu His Phe Cys Arg Gln Met Phe Ser Met Lys Val Asp 705 710 715 720

Asn Val Glu Tyr Ala Leu Leu Thr Ala lle Val lle Phe Ser Asp Arg 725 730 735

Pro Gly Leu Glu Lys Ala Gln Leu Yal Glu Ala lle Gln Ser Tyr Tyr 740 745 750

Ile Asp Thr Leu Arg Ile Tyr Ile Leu Asn Arg His Cys Cly Asp Ser 755 760 765

Het Ser Leu Val Phe Tyr Ala Lys Leu Leu Ser IIe Leu Thr Glu Leu 770 775 780 Arg Thr Leu Gly Asn Gln Asn Aia Glu Met Cys Phe Ser Leu Lys Leu 785 790 795 800

Lys Asn Arg Lys Leu Pro Lys Phe Leu Giu Giu Ile Trp Asp Val His 805 810 815

Ala lle Pro Pro Ser Val Gin Ser His Leu Gin lle Thr Gin Giu Giu 820 825 830

Aso Glu Arg Leu Glu Arg Ala Glu Arg Net Arg Ala Ser Val Gly Gly 835 840 845

Ala Ile Thr Ala Gly Ile Asp Cys Asp Ser Ala Ser Thr Ser Ala Ala 850 855 860

Ala Ala Ala Ala Gln His Gln Pro Gln Pr

Ser Ser Leu Thr Gln Asn Asp Ser Gln His Gln Thr Gln Pro Gln Leu 885 890 895

Gin Pro Gin Leu Pro Pro Gin Leu Gin Gly Gin Leu Gin Pro Gin Leu 900 905 910

Glu Pro Gln Leu Gln Thr Gln Leu Gln Pro Gln Ile Gln Pro Gln Pro 915 920 925

Glo Leu Leu Pro Val Ser Ala Pro Val Pro Ala Ser Val Tur Ala Pro 930 935 940

Gly Ser Leu Ser Ala Val Ser Thr Ser Ser Glu Tyr Met Gly Gly Ser 945 950 955 960

Ala Ala Ile Gly Pro Ile Thr Pro Ala Thr Thr Ser Ser Ile Thr Ala 965 970 975

Ala Val Thr Ala Ser Ser Thr Thr Ser Ala Val Pro Mei Gly Asn Gly 980 985 990

Val Gly Val Gly Val Gly Val Gly Gly Asn Val Ser Met Tyr Ala Asn 995 1000 1005

Ala Gln Thr Ala Met Ala Leu Met Gly Yal Ala Leu His Ser His Gln 1010 1015 1020

Glu Glu Leu De Gly Gly Yal Ala Yal Lys Ser Glu His Ser Thr Thr 1025 1030 1035 1040

Ala

# (2) INFORMATION FOR SEQ ID NO:10:

#### (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 13 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: both
- (D) TOPOLOGY: both

# `(ii) MOLECULE TYPE: DNA (genomic)

#### (ix) FEATURE:

- (A) NAME/KEY: misc\_feature
- (B) LOCATION: 7
- (D) OTHER INFORMATION: /product = "Modified Ecdysone Response Element" /note = "N at position 7 is 0 up to 5 nucleotides, with 1 nucleotide being especially preferred."

#### (xi) SEQUENCE DESCRIPTION: SEQ ID NO:10:

#### RGBNNMNTCN NCY

13

#### (2) INFORMATION FOR SEQ ID NO:11:

# (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 13 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: both
- (D) TOPOLOGY: both

# (ii) MOLECULE TYPE: DNA (genomic)

## (ix) FEATURE:

- (A) NAJIE/KEY: misc\_feature
- (B) LOCATION: 7
- (D) OTHER INFORMATION: /product = "Modified Ecdysone Response Element" /note = "N at position 7 can be 0 up to 5 nucleotides, with 1 nucleotide being preferred."

# (ci) SEQUENCE DESCRIPTION: SEQ ID NO:11:

## RGNNCANKNN VCY

13

# (2) INFORMATION FOR SEQ ID NO:12:

# (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 13 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: both
- (D) TOPOLOGY: both

#### (ii) MOLECULE TYPE: DNA (genomic)

#### (ci) SEQUENCE DESCRIPTION: SEQ ID NO:12:

# AGTGCANTGT TCT

13

#### (2) INFORMATION FOR SEQ ID NO:13:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 13 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: both
  - (D) TOPOLOGY: both

## (ii) MOLECULE TYPE: DNA (genomic)

- (ix) FEATURE:
  - (A) NAME/KEY: misc\_feature
  - (B) LOCATION: 7
  - (D) OTHER INFORMATION: /product = "Ecdysone Response

Element"

/note = "N at position 7 can be 0 up to 5 nucleotides, with 3 nucleotides being preferred."

#### (ci) SEQUENCE DESCRIPTION: SEQ ID NO:13:

# RGBNNHNRGB NNM

13

# (2) INFORMATION FOR SEQ ID NO:14:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 49 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: both
  - (D) TOPOLOGY: both

# (ii) MOLECULE TYPE: DNA (genomic)

# (ci) SEQUENCE DESCRIPTION: SEQ ID NO:14:

#### TACAACGCCC TCACCTGTGG ATCCTGCAAG GTGTTTCTTT CGACGCAGC

49

#### (2) INFORMATION FOR SEQ ID NO:15:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 53 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: both
  - (D) TOPOLOGY: both

# (ii) HOLECULE TYPE: DNA (genomic)

CTACTCCCCC GGCGGGCTA TGCGGGGCGG GGCTAATCGC TAGGGGCCGGG GCA

5

# (2) INFORMATION FOR SEQ ID NO:16:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 53 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: both
  - (D) TOPOLOGY: both
- (ii) MOLECULE TYPE: DNA (genomic)
- (xi) SEQUENCE DESCRIPTION: SEQ ID NO:16:

53

## (2) INFORMATION FOR SEQ ID NO:17:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENCTH: 34 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: both
  - (D) TOPOLOGY: both
- (ii) MOLECULE TYPE: DNA (genomic)
- (ci) SEQUENCE DESCRIPTION: SEQ ID NO:17:

AGCTCGATGG ACAAGTGCAT TCTTCTTTGC TGAA

- (2) INFORMATION FOR SEQ ID NO:18:
  - (i) SEQUENCE CHARACTERISTICS:
    - (A) LENGTH: 35 base pairs
    - (B) TYPE: nucleic acid
    - (C) STRANDEDNESS: both
    - (D) TOPOLOGY: both
- (ii) MOLECULE TYPE: DNA (genomic)

(ci) SEQUENCE DESCRIPTION: SEQ ID NO:18:

AGCTTTCAGC AAGAGAACAA TGCACTTGTC CATCG